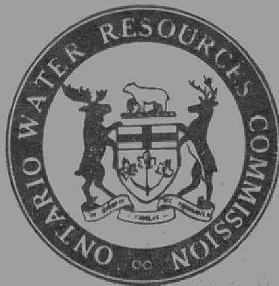


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O.W.R.C.
Water Pollution
Survey

THE
ONTARIO WATER RESOURCES
COMMISSION



WATER POLLUTION SURVEY

of the

VILLAGE OF COOKSTOWN

COUNTY OF SIMCOE

1969

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Report

on a

Water Pollution Survey

of the

VILLAGE OF COOKSTOWN

County of Simcoe

November, 1969

District Engineers Branch

Division of Sanitary Engineering

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R E P O R T

ONTARIO WATER RESOURCES COMMISSION

INTRODUCTION

This report is an assessment of surface water quality within the Village of Cookstown and reference is also made to the affected portion of the watershed. Surveys of this nature are made by the Ontario Water Resources Commission to record general conditions of the water resources within a municipality by locating sources of existing and potential water pollution. Where these sources are noted, recommendations regarding their abatement are made to the parties concerned. Where pollution problems are of a municipal nature the OWRC advises municipalities concerning their needs for sewage treatment and is able to construct, finance, and operate water and sewage facilities upon request from the municipality.

On May 9th, and June 11th, 1969 samples were collected from drainage courses within the municipality. In addition upstream and downstream samples from the local watercourses were submitted. During the June 11 investigation, several premises where sewage disposal problems were apparent were inspected with Mr. A. Kidd, Village Councillor and Mr. J. Code, Public Health Inspector, Simcoe County Health Unit. Their assistance was appreciated.

(1) General

The Village of Cookstown has an assessed population of 715. It is located at the junction of Highways 27 and 89 in the south-eastern portion of the County of Simcoe.

The municipality lies in a fairly undulating terrain with the majority of the village in the low area of a gradual slope from east to west. Overburden consists of moderate to heavy clay.

(2) Drainage

Cookstown is situated within the watershed of the Nottawasaga River. A small tributary, designated as the Cookstown Branch, rises north of the village in the Township of Essa and flows in a southerly direction west of the village. The tributary joins several small creeks, Innisfil Creek, Pennville Creek, Beeton Creek and Bailey Creek as the flow proceeds westerly to the Nottawasaga River eventually emptying into Georgian Bay near Wasaga Beach. The Cookstown Branch provides drainage for a relatively small area and in dry weather the flow is minimal.

Drainage from the village to this branch is by open ditches and on the main street, short runs of storm sewers. Surface drainage to these ditches, in some instances, flows over existing lots and in the spring flooding of septic tank tile

fields is inevitable.

The stream sampling points are generally designated by using the first letter of each of the associated watercourses and the approximate mileage from the mouth of the main watercourse, the Nottawasaga River.

(3) Expansion

Several inquiries from developers interested in locating in Cookstown have been received by the municipality. Council, being aware of the necessity of extension of services to accomodate any of these proposals has met with staff of the Division of Sanitary Engineering of the OWRC to discuss these requirements. Brief comment on the present conditions and their relationship which must influence any planned expansion are contained in other sections of this report.

(4) Water Uses

(A) Municipal Water Works - OWRC Project 58 - W - 281

Water is obtained from one deep well and is pumped directly to the distribution system. No treatment is provided. A 200,000 gallon stand pipe provides storage and rides on the system.

The pump capacity is 42 gallons per minute against a 250 foot head. The majority of the village is connected to this system. The average daily usage for 1968 was approximately 20,000 gallons which represents a low per capita usage of 29

gallons per day. Although the present system is capable of providing the past moderate demands of the village, good planning warrants upgrading of the system to allow for reasonable development and to satisfy the increasing demands of modern housing.

The water is hard but otherwise of satisfactory chemical and bacteriological quality.

(B) Recreational Uses

The seasonal flow restricts recreational activities to some early season fishing.

WATER POLLUTION

(1) Sewage Disposal

Domestic wastes are treated in private sewage disposal systems. The septic tank and tile field method of sewage disposal is most prevalent and where these systems have been installed to the specifications of the Simcoe County Health Unit problems have not been wide-spread. At some older premises where uninspected initial installations were put on small lots, some ponding of sewage on the surface was evident. Several houses were recently built on small lots which were on a previously registered plan. Reliable sewage disposal on these small lots is difficult and certainly any new development, where septic tank and tile field method of sewage disposal is proposed, should be on adequately - sized lots.

Generally, the clay soil predominant in most of the village also hinders effective operation of an underground disposal field. In specific areas where sewage disposal problems were evident the situation was further aggravated by the lack of drainage conduits which caused flooding of tile fields. The poor permeability of the soil, as well as being a problem in septic tank and tile field operation, enables rapid run-off of surface water. A drainage study to determine the best method of re-directing this run-off away from the existing premises would be appropriate.

(2) Pollution Sources

The observations made on flooding of septic tank tile fields and related surface run-off was confirmed by laboratory analyses as being sources of pollution. On May 9th, after rainy weather, the ditches and the watercourse had a good flow. Samples from the drainage run-off were taken at several locations which are indicated on the enclosed Table No. 1. The high coliform counts recorded in the results of the bacteriological examination are significant evidence of sewage run-off. This waste is gaining access to a tributary (Cookstown Branch) of the Nottawasaga River watershed. Impairment of this watercourse is indicated by the increase in coliform organisms downstream from the drainage outfalls.

In comparison, the lab results of the samples collected from the watercourse during dry weather flow (June 11, 1969) showed no significant change.

On the June 11th inspection there were 10 premises inspected with Mr. Kidd, Councillor and Mr. J. Code, the local health inspector. The sewage disposal systems at these premises were known to have problems and evident ponding or discharges to street ditches were noted. Five of these were on lots where approved repairs would be possible. The remaining problem areas were adversely effected by flooding of the tile fields.

SUMMARY AND CONCLUSIONS

An additional water supply should be planned prior to any future large scale development.

The survey revealed that pollution of the Cookstown Branch of the Nottawasaga River occurs downstream from Cookstown during heavy flows. The source of this impairment was found to be malfunctioning septic tank systems. Flooding of the disposal fields, heavy clay soil and improperly constructed older systems were also contributing factors. Improved drainage and approved alterations would facilitate adequate sewage disposal on a private basis. Reliable sewage disposal on the small lots of previously registered plans is difficult and any future development where private sewage disposal is planned should be on adequately

sized lots. Deviation from an acceptable lot size would necessitate a communal sewerage system.

RECOMMENDATIONS

1. A drainage study to determine the best methods of preventing flooding of sewage disposal fields should be carried out.

2. Malfunctioning septic tank and tile bed systems should be repaired to the specifications of the Simcoe County Health Unit.

3. Future development should be limited to adequately sized lots and curtailed to some extent until the possibilities of providing communal services are explored.

/ps

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Sanitary Engineering,
Div. of Sanitary Engineering.

APPENDIX

EXPLANATION AND SIGNIFICANCE OF LABORATORY ANALYSES

(A) Bacteriological Examinations

Bacteriological examinations were performed on samples from the watercourse. The Membrane Filter technique was used to obtain a direct enumeration of coliform organisms. These organisms are normal inhabitants of the intestines of man and other warm blooded animals. They are always present in sewage and are generally minimal in other pollutants. The results of the examinations are reported as MF Coliform Count per 100 ml.

The Commission objective for surface waters in Ontario is a coliform count of not greater than 2400 organisms per 100 ml.

(B) Chemical Analyses

The chemical analysis performed on stream samples included determinations for biochemical oxygen demand, (BOD) suspended solids and in some instances, turbidity.

(1) Biochemical Oxygen Demand (BOD)

Biochemical oxygen demand is reported in parts per million (ppm) and is an indication of the amount of oxygen required for stabilization of decomposable organic matter present in sewage, polluted waters, or industrial wastes. The completion of the test requires five days, under the controlled incubation temperature of 20°C.

The Commission water quality objectives for stream water a 5-day BOD of not greater than 4 ppm; for storm sewer, water pollution control plant and industrial waste discharges - a 5-Day BOD of not greater than 15 ppm.

(2) Solids

The laboratory does tests to determine the total and suspended solids in a sample. The value for dissolved solids is determined by taking the mathematical difference between the total and suspended solids.

The concentration of suspended solids expressed in parts per million (ppm) is generally the most significant of the solids analyses in regard to stream water and outfall discharge qualities.

The OWRC objective for discharge is a suspended solids concentration of not greater than 15 ppm.

(3) Turbidity

Turbidity is caused by the presence of suspended matter such as clay, silt, finely divided organic matter, plankton and other microscopic organisms in water or outfall discharges. It is an expression of the optical property of a sample and the results are reported in "Silica Units".

VILLAGE OF COOKSTOWN

WATER POLLUTION SURVEY - 1969

TABLE I

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Solids</u>		<u>M.F. Coliform per 100 ml</u>	<u>Remarks</u>
				<u>Total (ppm)</u>	<u>Susp.</u>		
C- 2	Ditch-South side of Highway 89 near out fall to Cookstown Branch.	May 9/69 June 11/69	1.8	580	5	L-10	Run-off No dry weather Flow (D.W.F.)
C-3	Ditch-North side of Highway 89 near outfall.	May 9/69 June 11/69	2.0	920	10	1,690,000	Flows through pasture land.
C-5	Ditch - at Garibaldi St. & St. George St.	May 9/69 June 11/69	2.4	890	20	250,000	No D.W.F.
C-6	Ditch at Cn culvert-downstream from Wilsons Mill	May 9/69 June 11/69	4.5	820	60	120,000	Evidence of S.T. Ponding Upstream
C-7	Ditch near John and George Streets	May 9/69 June 11/69				15,600	No D.W.F.
C-8	Ditch at Wellington St. and Fisher Lane	May 9/69 June 11/69	1.8	880	10	34,000	No D. W. F.

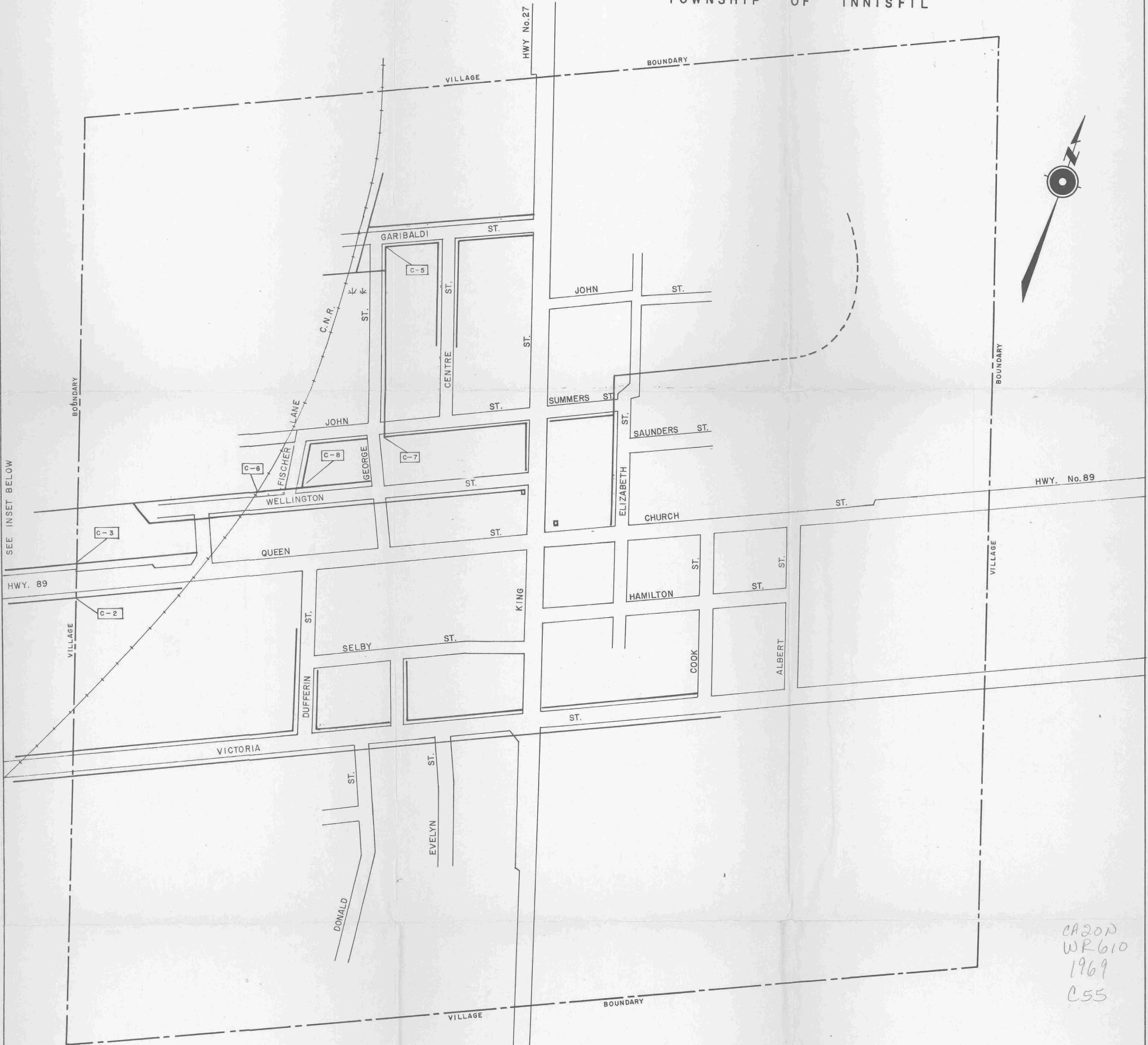
VILLAGE OF COOKSTOWN
WATER POLLUTION SURVEY

TABLE II

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Solids</u>		<u>M.F. Coliform Count Per 100 ML</u>
				<u>Total (ppm)</u>	<u>Susp. (ppm)</u>	
NTFC 62.1	Cookstown Branch	May 9/69	0.8	380	5	700
	Upstream from Village at No. 5 side Rd. - Twp. of Essa.	June 11/69	0.8	300	5	4,200
NTFC 60.8	Cookstown Branch	May 9/69	1.4	410	10	180,000
	Downstream from Village - Highway 89	June 11/69	1.6	320	5	6,400
NTFC 60.2	Cookstown Branch at Victoria St. Bridge (Town Line)	June 11/69	1.2	280	5	6,600

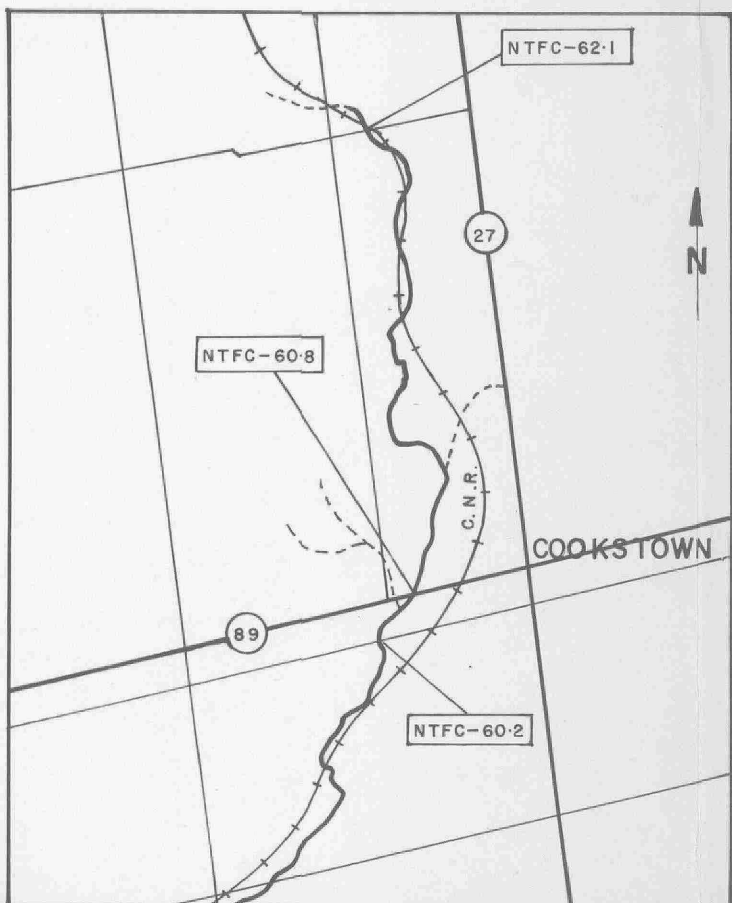
TOWNSHIP OF ESSA

TOWNSHIP OF INNISFIL



TOWNSHIP OF TECUMSETH

TOWNSHIP OF WEST G WILLIMBURY



LEGEND

- DITCH
- CATCH BASIN
- SWAMP
- NTFC-62-1 — STREAM SAMPLING POINT SHOWING MILEAGE
- C-2 — DITCH SAMPLING POINT



*Out
Environ
Water Treat*

ONTARIO WATER RESOURCES COMMISSION	
VILLAGE OF COOKSTOWN WATER POLLUTION SURVEY 1969	
SCALE: 200 0 200 400 FT.	
DRAWN BY: L. L. BROOME	DATE: JULY, 1969
CHECKED BY: D. C.	DRAWING No: 69-96-DE



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